

Attorney's Docket No.: 05542-303002 / 002834C2

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Steven M. Zuniga
Serial No. : 09/848,630
Filed : May 3, 2001
Title : CARRIER HEAD WITH A MULTILAYER RETAINING RING FOR
CHEMICAL MECHANICAL POLISHING

Art Unit : 1763
Examiner : Robert Culbert

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF STEVEN M. ZUNIGA UNDER 37 C.F.R. § 1.131

I, Steven M. Zuniga, hereby declare:

1. That I am an inventor of the claims in the above-captioned patent application.
2. That I have been an employee of Applied Materials, Inc. since August 1994.
3. That in a non-final Office Action dated October 19, 2005, the claims were rejected as being unpatentable over U.S. Patent No. 6,068,548 ("Vote"). Vote was filed on December 17, 1997, and on its face does not claim priority to an earlier filed application or patent.
4. That on or before December 17, 2002, in the United States, I conceived of a retaining ring for use in a carrier head, e.g., in chemical mechanical polishing system. The retaining ring includes a generally annular lower portion having a bottom surface for contacting a polishing pad during polishing and a generally annular upper portion having a bottom surface secured to the lower portion and a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head. The lower portion is made of a plastic, and the upper portion is made of a metal which is more rigid than the plastic.

CERTIFICATE OF TRANSMISSION BY FACSIMILE

I hereby certify that this correspondence is being transmitted by facsimile to the Patent and Trademark Office on the date indicated below.

Date of Transmission

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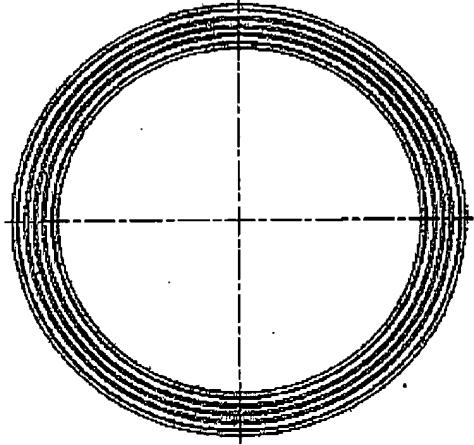
Typed or Printed Name of Person Signing Certificate

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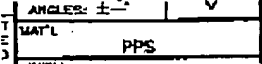
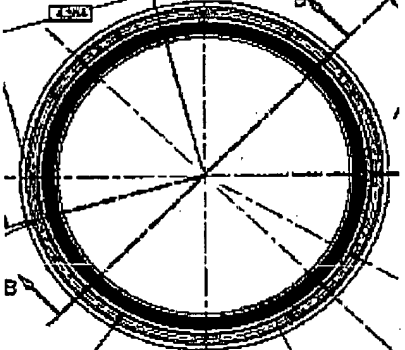
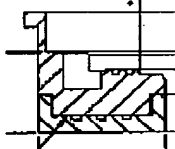
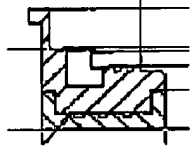
5. As evidence of my conception and reduction to practice, Exhibits 1-3 are copies of CAD drawings I prepared on or before December 17, 1997. Exhibit 1 includes a cross-sectional side view showing the upper and lower rings; Exhibit 2 includes a plan view and cross-sectional side view showing the lower ring; and Exhibit 3 includes a plan view and cross-sectional side views showing the upper ring. Exhibit 4 is a copy of a page from a presentation on or before December 17, 1997 in which I prepared the bullet points. Exhibit 5 is a copy of a page from a presentation on or before December 17, 1997 by Tom Osterheld, the lead process engineer on the "composite ring" project, showing data from testing of the claimed retaining ring.

6. The following table shows the support in the Exhibits for the claimed invention as recited in independent claim 13.

Claim 13 Limitations	Support for Conception
A retaining ring for a carrier head having a mounting surface for a substrate	<p>Exhibits 1-3 illustrate the retaining ring, "BONDED RING" refers to the retaining ring.</p>  <p>Exhibit 4, discusses "retaining ring"; "Titan Head" refers to Applied Materials carrier head.</p>
a generally annular lower portion having a bottom surface for contacting a polishing pad during polishing,	<p>The plan view in Exhibit 2 shows the lower portion as annular.</p>  <p>Exhibit 4, describes a "wear surface", indicating that the bottom surface contacts the polishing pad during polishing</p>

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<p>the lower portion made of a plastic;</p>	<p>Exhibit 2 provides that the material of the lower ring is PPS.</p>  <p>Exhibit 4 states "PPS wear surface" "PPS" refers to polyphenylene sulfide, which is a plastic.</p>
<p>a generally annular upper portion</p>	<p>Exhibit 3 shows upper portion as annular.</p> 
<p>having a bottom surface secured to the lower portion</p>	<p>Exhibit 1, illustrates the bottom surface of the upper ring contacting the lower portion and states "BOND WITH LOCTITE DEPEND 330 ADHESIVE".</p>  <p>BOND WITH LOCTITE DEPEND 330 ADHESIVE PER MANUFACTURER'S INSTRUCTIONS</p>
<p>and a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head,</p>	<p>Exhibits 1 and 3 show the top surface of retaining ring.</p>  <p>The complex shape of the top surface was configured to abut a base in the carrier head, e.g., in a manner similar to how the top surface of the completely plastic ring abutted the base in the carrier as shown in Figures 4A-4B of U.S. Patent No. 6,183,354.</p>

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	<p>FIG. 4 4A 4B</p> <p>FIG. 4A</p>
<p>wherein the upper portion is made of a metal which is more rigid than the plastic.</p>	<p>Exhibit 3 provides that the material of the upper ring is 303 SST. "SST" refers to stainless steel.</p> <p>Exhibit 4 states "metal backing" Stainless steel is more rigid than polyphenylene sulfide.</p>

7. That or before December 17, 1997 a retaining ring meeting the having a metal upper portion and a PPS lower portion was reduced to practice by being constructed and tested.

8. As evidence of reduction to practice, Exhibit 4 states "8 prototypes fabricated". These prototypes included rings meeting the limitations of claim 1. Exhibit 4 further states "Rigid bonded giving good performance". This refers to testing of the bonded two-part retaining rings.

9. As further evidence of reduction to practice, Exhibit 5 shows data, specifically a polishing profile, from test polishing of a wafer using the claimed retaining ring.

10. The dates in Exhibits 1-5 have been redacted, however all the redacted dates were on or before December 17, 1997.

11. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that

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these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of inventor: STEVEN M. ZUNIGA

Inventor's signature: Steven M. Zuniga

Date: April 19, 2006

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Exhibit 1

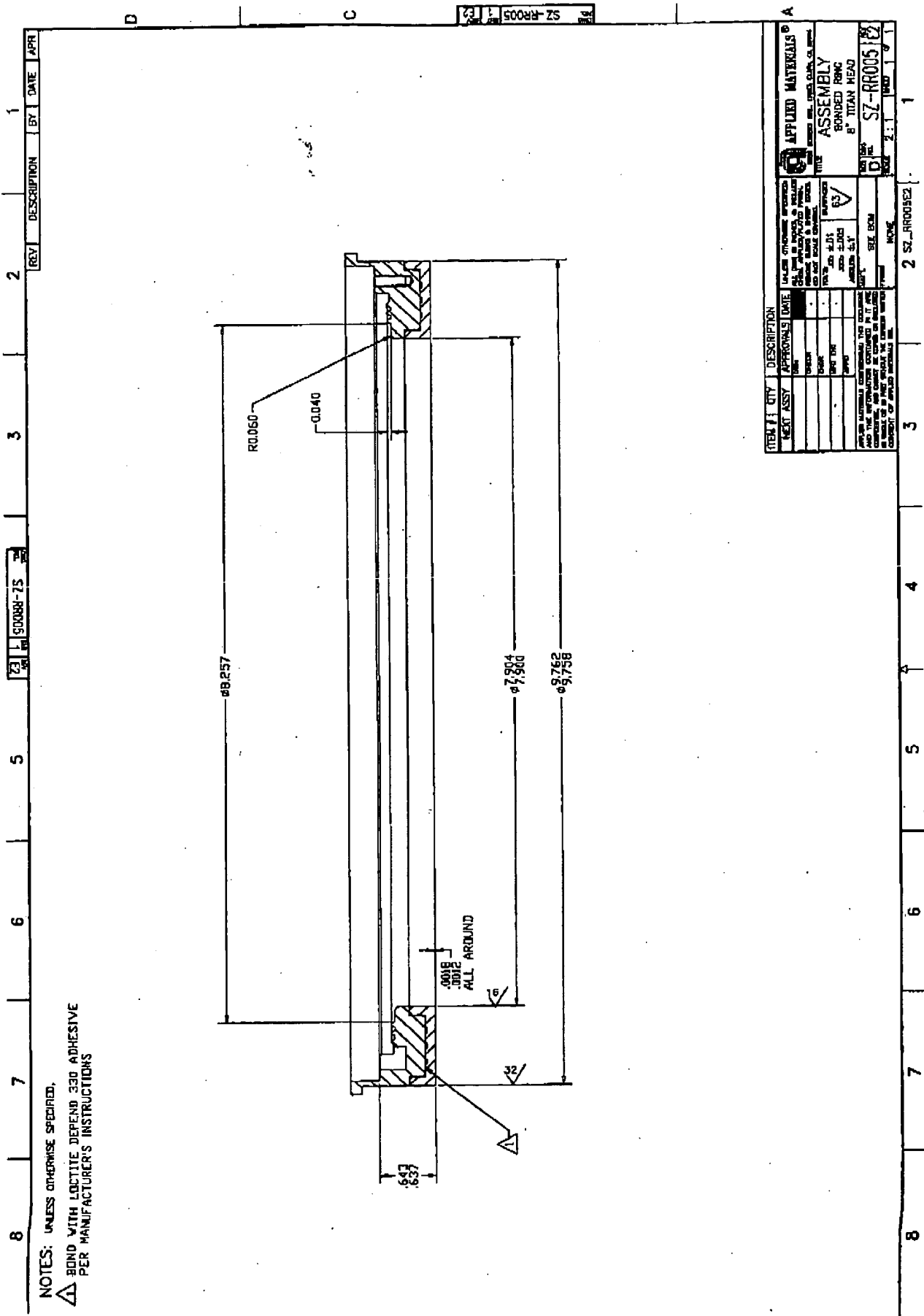


Exhibit 2

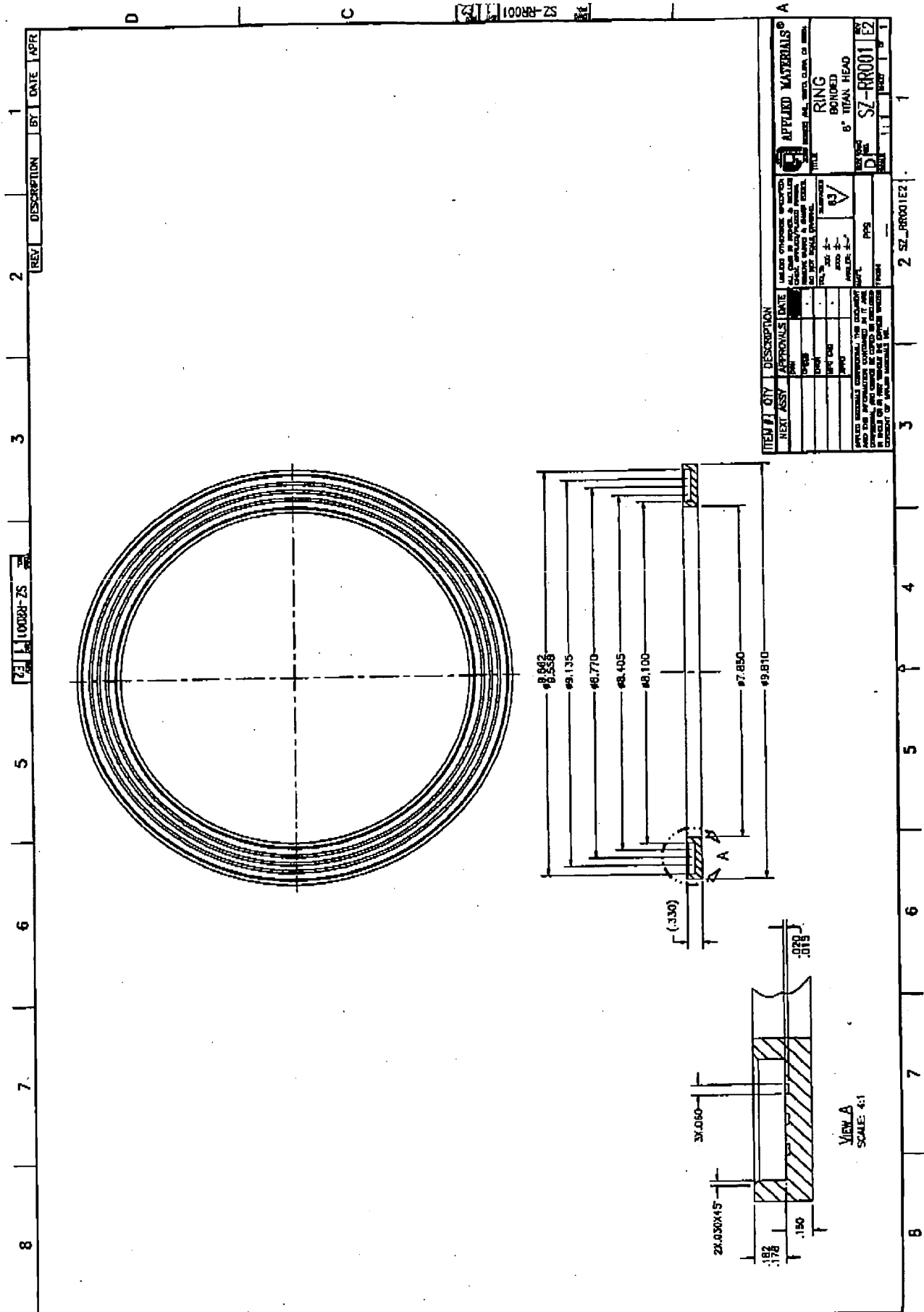


Exhibit 3

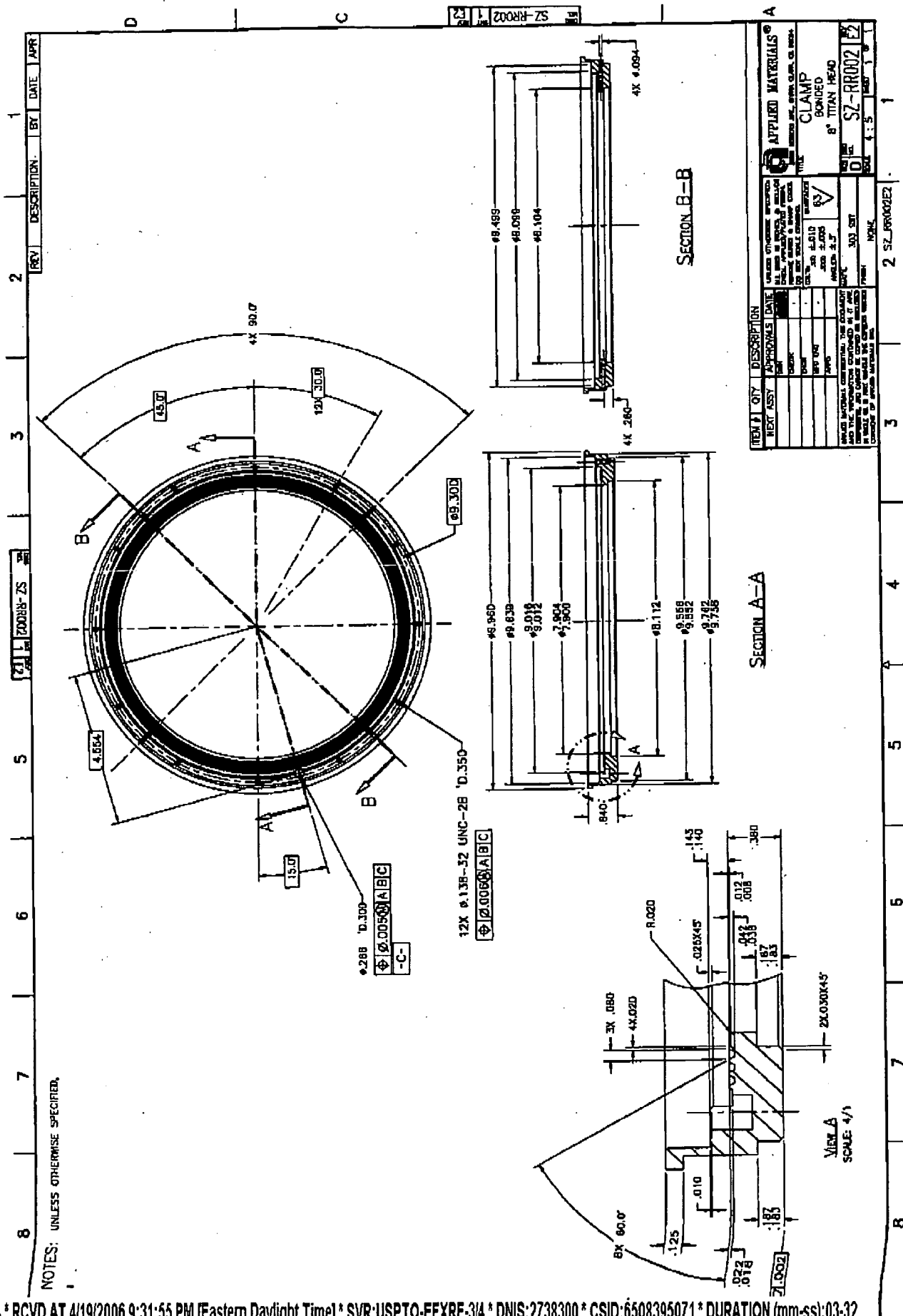


Exhibit 4

MIRRA

Titan Head Roadmap

- "No Lap" retaining ring #1 priority for CMP group until manufacturable solution is identified. **Goal: Good solution by 10/31. Better solutions may follow.**
 - "No lap" ring development driving understanding of retaining ring: edge exclusion relationship - may result in long term EE improvements
 - ~8 prototypes fabricated
 - Focusing on metal backing with PPS wear surface
 - Rings with "compliance" give poor edge performance
 - Rigid bonded giving good performance - some ring to ring variability still seen in prototypes. Source of variation under investigation
 - "Crowned" PPS ring giving good performance

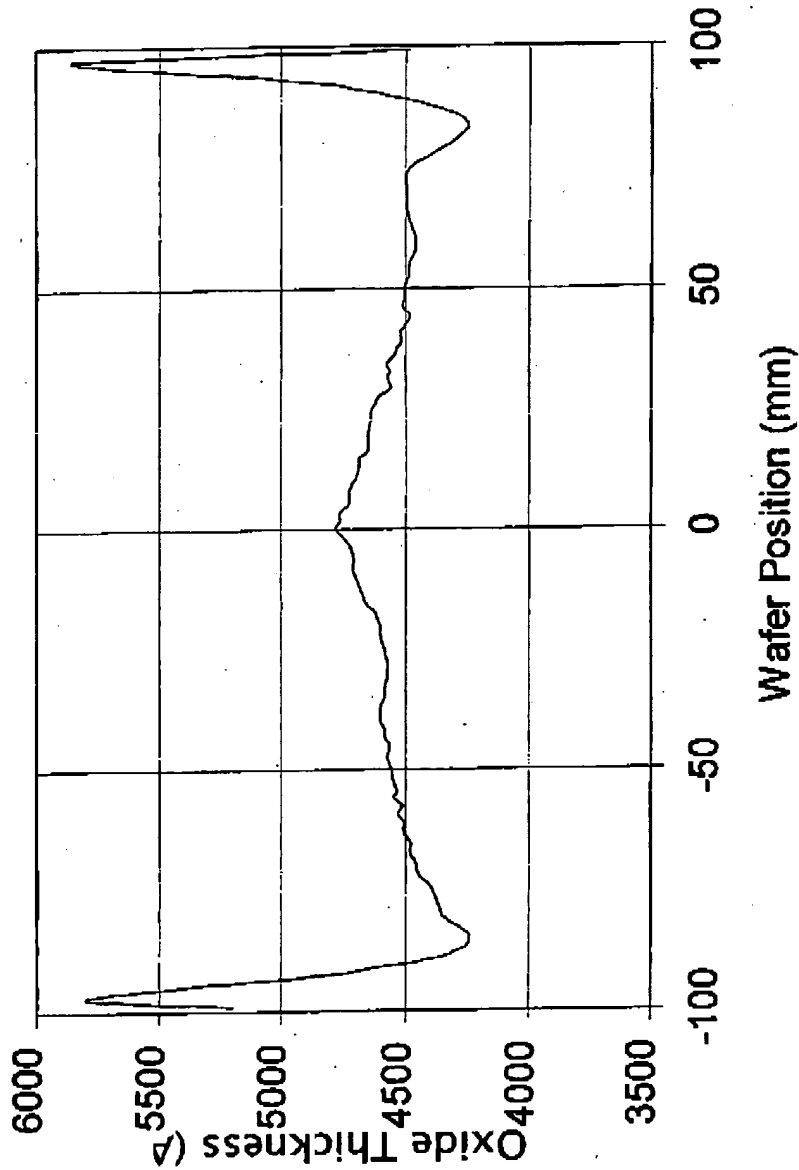


APPLIED MATERIALS CONFIDENTIAL

RD1

Exhibit 5

Stainless Steel/PPS Composite Ring Yields an Edge-Slow Process Under BKM Conditions



Issue: *WIWNU Cannot be fixed by Retaining Ring Pressure*



Applied Materials Confidential

OXIDE OPS